

PARTIAL TEST REPORT

ACCORDING TO:

**FCC 47CFR part 15 subpart C §15.247 (FHSS) and subpart B,
RSS-247 Issue 2:2017, RSS-Gen issue 5, ICES-003 Issue 7:2020**

FOR:

Visonic Ltd.

Wireless Digital Pet Immune PIR Detector

Model: MP-802 P9M0

FCC ID: WP3MP802PG2

This report is in conformity with ISO/IEC 17025. The "A2LA Accredited" symbol endorsement applies only to the tests and calibrations that are listed in the scope of Hermon Laboratories accreditation. The test results relate only to the items tested.
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1 Applicant information

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Contact name: Mr. Zuri Rubin

2 Equipment under test attributes

Product name: Wireless Digital Pet Immune PIR Detector
Product type: Transceiver
Model(s): MP-802 P9M0
Serial number: NA
Hardware version: 90-210074
Software release: JS-703861
Receipt date: 02-Feb-22

3 Manufacturer information

Manufacturer name: Visonic Ltd.
Address: 24 Habarzel street, Tel Aviv 69710, Israel
Telephone: +972 3645 6832
Fax: +972 3645 6788
E-Mail: zuri.rubin@jci.com
Contact name: Mr. Zuri Rubin

4 Test details

Project ID: 47079
Location: Hermon Laboratories Ltd. P.O. Box 23, Binyamina 3055001, Israel
Test started: 31-May-22
Test completed: 03-Jun-22
Test specification(s): FCC 47CFR part 15 subpart C §15.247 (FHSS) and subpart B, RSS-247 Issue 2:2017, RSS-Gen Issue 5, ICES-003 Issue 7:2020



5 Tests summary

Test	Status
Transmitter characteristics	
FCC section 15.247(a)1/ RSS-247 section 5.1(c), 20 dB bandwidth	Not required
FCC section 15.247(a)1/ RSS-247 section 5.1(b), Frequency separation	Not required
FCC section 15.247(a)1/ RSS-247 section 5.1(c), Number of hopping frequencies	Not required
FCC section 15.247(a)1/ RSS-247 section 5.1(c), Average time of occupancy	Not required
FCC section 15.247(b) / RSS-247 section 5.4(a), Peak output power	Pass*
FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions	Pass*
FCC section 15.247(d) / RSS-247 section 5.5, Emissions at band edges	Not required
FCC section 15.247(i)5/ RSS-102 section 2.5, RF exposure	Pass, the exhibit to the application of certification is provided*
FCC section 15.203/ RSS-Gen section 6.8, Antenna requirements	Not required
FCC section 15.207(a) / RSS-Gen section 8.8, Conducted emission	Not required
Unintentional emissions	
FCC section 15.107/ICES-003, Section 6.1, Class B, Conducted emission at AC power port	Not required
FCC section 15.109/ RSS-Gen section 7.3 /ICES-003, Section 6.2, Class B, Radiated emission	Pass*

The EUT were certified by FCC under FCC ID: WP3MP802PG2. The EUT was revised with the following changes:

1. Upgraded operational low frequency (0.3 - 5Hz) PIR sensor signal amplifier without any relation to radio.
2. Antenna – Same p/n different Reference designator.
3. New plastic.
4. New PCB design meet to new plastic, added SW1 back tamper functionality.
5. New SW for support an enhanced encrypted key, over-the-air firmware upgrade, device lock down and lockable sensors.
6. Adding Flash Memory.

*The relevant tests were performed to support Application for Class II permissive changes certification.

This certificate supersedes the previously issued certificate identified by Doc ID: VISRAD_FCC.47079_28802

Testing was completed against all relevant requirements of the test standard. The results obtained indicate that the product under test complies in full with the requirements tested.

The test results relate only to the items tested. Pass/ fail decision was based on nominal values.

	Name and Title	Date	Signature
Tested by:	Mrs. E. Pitt, test engineer, EMC & Radio	31-May-22 – 03-Jun-22	
Reviewed by:	Mrs. S. Peysahov Sheynin, test engineer, EMC & Radio	19-Jun-22	
Approved by:	Mr. M. Nikishin, group leader, EMC & Radio	13-Jul-22	



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6 EUT description

Note: The following data in this clause is provided by the customer and represents his sole responsibility

6.1 General information

The EUT is a wireless indoor PIR detector, battery fed. It comprises a radio module operating at 915 MHz.

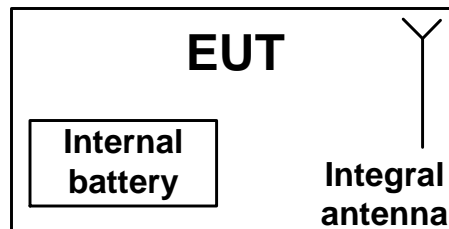
The purpose for this test report is the compliance with minor modification that was made relatively to original test report VISRAD_FCC.28802_rev1, issued by Hermon Laboratories.

The new model MP-802 P9M0, that was tested in the present test report have identical RF part configuration and differenced only with HW redesign of PCB, new plastic and SW that will support a new future as stated in manufacturer's declarations (refer to Appendix F of the test report).

6.2 Changes made in EUT

No changes were implemented in the EUT during the testing.

6.3 Test configuration





6.4 Transmitter characteristics

Type of equipment						
X	Stand-alone (Equipment with or without its own control provisions)					
	Combined equipment (Equipment where the radio part is fully integrated within another type of equipment)					
	Plug-in card (Equipment intended for a variety of host systems)					
Intended use		Condition of use				
	fixed	Always at a distance more than 2 m from all people				
X	mobile	Always at a distance more than 20 cm from all people				
	portable	May operate at a distance closer than 20 cm to human body				
Assigned frequency ranges		902 – 928 MHz				
Operating frequencies		912.750 – 919.108 MHz				
Maximum rated output power		At transmitter 50 Ω RF output connector			dBm	
		Peak output power			13.17 dBm	
Is transmitter output power variable?		X	No			
			Yes	continuous variable		
				stepped variable with stepsize		
				dB		
		minimum RF power				
		maximum RF power				
		dBm				
		dBm				
Antenna connection						
unique coupling		standard connector		X	integral	
				X	with temporary RF connector	
					without temporary RF connector	
Antenna/s technical characteristics						
Type		Manufacturer		Model number		
Internal		Ocean		Capacitive Coupling Antenna, Visonic P.N--H-306097		
				Gain		
				-1 dBi		
Transmitter aggregate data rate/s			50 kbps			
Type of modulation			GFSK			
Modulating test signal (baseband)			PRBS			
Transmitter power source						
X	Battery	Nominal rated voltage	3.0 V	Battery type	CR123A	
	DC	Nominal rated voltage				
	AC mains	Nominal rated voltage		Frequency		
Common power source for transmitter and receiver				X	yes	
					no	
Spread spectrum technique used		X	Frequency hopping (FHSS)			
			Digital transmission system (DTS)			
			Hybrid			
Spread spectrum parameters for transmitters tested per FCC 15.247 only						
FHSS	Total number of hops		50			
	Bandwidth per hop		90.13 kHz			
	Max. separation of hops		133 kHz			



Test specification: Section 15.247(b), RSS-247 section 5.4(1), Peak output power			
Test procedure: ANSI C63.10, section 7.8.5			
Test mode: Compliance		Verdict: PASS	
Date(s): 31-May-22			
Temperature: 23 °C	Relative Humidity: 43 %	Air Pressure: 1012 hPa	Power: 3 VDC
Remarks:			

7 Transmitter tests according to 47CFR part 15 subpart C and RSS-247 requirements

7.1 Peak output power

7.1.1 General

This test was performed to measure the maximum peak output power radiated by transmitter. Specification test limits are given in Table 7.1.1.

Table 7.1.1 Peak output power limits

Assigned frequency range, MHz	Peak output power*		Equivalent field strength limit @ 3m, dB(μV/m)*	Maximum antenna gain, dBi
	W	dBm		
902.0 – 928.0	0.25 (<50 hopping channels)	24.0(<50 hopping channels)	125.2 (<50 hopping channels)	6.0*
	1.0 (≥50 hopping channels)	30.0 (≥50 hopping channels)	131.2 (≥50 hopping channels)	
2400.0 – 2483.5	0.125 (<75 hopping channels)	21.0(<75 hopping channels)	122.2 (<75 hopping channels)	
	1.0 (≥75 hopping channels)	30.0 (≥75 hopping channels)	131.2 (≥75 hopping channels)	
5725.0 – 5850.0	1.0	30.0	131.2	

*- Equivalent field strength limit was calculated from the peak output power as follows: $E = \sqrt{(30 \times P \times G)/r}$, where P is peak output power in Watts, r is antenna to EUT distance in meters and G is transmitter antenna gain in dBi.

** - The limit is provided in terms of conducted RF power at the antenna connector. If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power limit shall be reduced below the stated value as follows:

- by 1 dB for every 3 dB that the directional gain of antenna exceeds 6 dBi for fixed point-to-point transmitters operate in 2400-2483.5 MHz band;
- without any corresponding reduction for fixed point-to-point transmitters operate in 5725-5850 MHz band;
- by the amount in dB that the directional gain of antenna exceeds 6 dBi for the rest of transmitters.

7.1.2 Test procedure

7.1.2.1 The EUT was set up as shown in Figure 7.1.1, energized and its proper operation was checked.

7.1.2.2 The EUT was adjusted to produce maximum available to end user RF output power.

7.1.2.3 The frequency span of spectrum analyzer was set approximately 5 times wider than 20 dB bandwidth of the EUT and the resolution bandwidth was set wider than 20 dB bandwidth of the EUT. To find maximum radiation the turntable was rotated 360° and the measuring antenna height was swept in both vertical and horizontal polarizations.

7.1.2.4 The maximum field strength of the EUT carrier frequency was measured as provided in Table 7.1.2 and associated plots.

7.1.2.5 The maximum peak output power was calculated from the field strength of carrier as follows:

$$P = (E \times d)^2 / (30 \times G),$$

where P is the peak output power in W, E is the field strength in V/m, d is the test distance and G is the transmitter numeric antenna gain over an isotropic radiator.

The above equation was converted in logarithmic units for 3 m test distance:

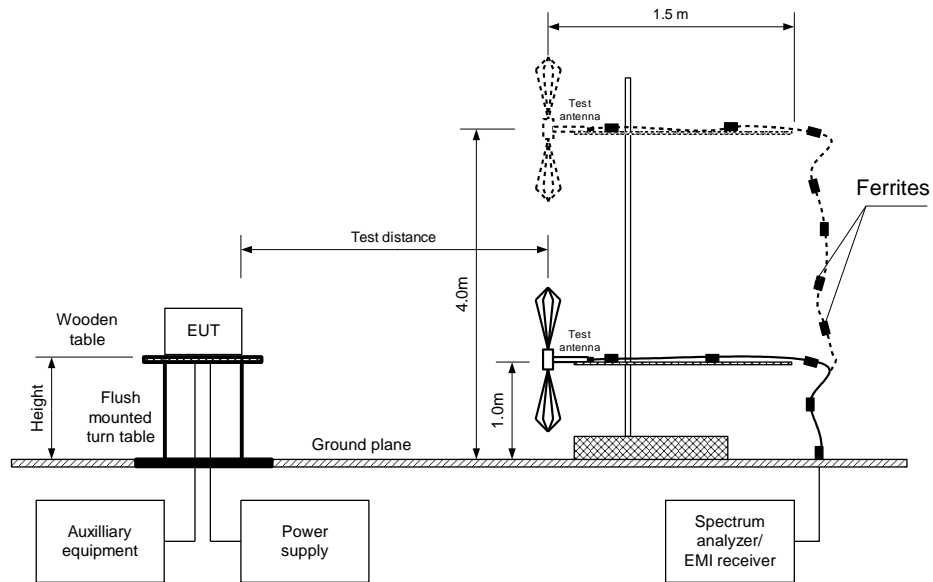
$$\text{Peak output power in dBm} = \text{Field strength in dB}(\mu\text{V/m}) - \text{Transmitter antenna gain in dBi} - 95.2 \text{ dB}$$

7.1.2.6 The worst test results (the lowest margins) were recorded in Table 7.1.2.



Test specification: Section 15.247(b), RSS-247 section 5.4(1), Peak output power			
Test procedure: ANSI C63.10, section 7.8.5			
Test mode: Compliance		Verdict: PASS	
Date(s): 31-May-22			
Temperature: 23 °C	Relative Humidity: 43 %	Air Pressure: 1012 hPa	Power: 3 VDC
Remarks:			

Figure 7.1.1 Setup for carrier field strength measurements





Test specification: Section 15.247(b), RSS-247 section 5.4(1), Peak output power			
Test procedure: ANSI C63.10, section 7.8.5			
Test mode: Compliance		Verdict: PASS	
Date(s): 31-May-22			
Temperature: 23 °C	Relative Humidity: 43 %	Air Pressure: 1012 hPa	Power: 3 VDC
Remarks:			

Table 7.1.2 Peak output power test results

ASSIGNED FREQUENCY: 902-928 MHz
TEST DISTANCE: 3 m
TEST SITE: Semi anechoic chamber
EUT HEIGHT: 0.8 m
DETECTOR USED: Peak
MODULATION: GFSK
BIT RATE: 50 kbps
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
DETECTOR USED: Peak
FREQUENCY HOPPING: Disabled

Frequency, MHz	Field strength, dB(µV/m)	Antenna polarization	Antenna height, m	Azimuth, degrees*	EUT antenna gain, dBi	Peak output power, dBm**	Limit, dBm	Margin, dB***	Verdict
912.750	106.65	V	1.1	20	-1	12.45	30	-17.55	Pass
915.863	107.37	V	1.1	25	-1	13.17	30	-16.83	Pass
919.106	106.58	V	1.1	30	-1	12.38	30	-17.62	Pass

*- EUT front panel refer to 0 degrees position of turntable.

** - Peak output power was calculated from the field strength of carrier as follows: $P = (E \times d)^2 / (30 \times G)$, where P is the peak output power in W, E is the field strength in V/m, d is the test distance in meters and G is the transmitter numeric antenna gain over an isotropic radiator. The above equation was converted in logarithmic units for 3 m test distance: *Peak output power in dBm = Field strength in dB(µV/m) - Transmitter antenna gain in dBi - 95.2 dB*

*** - Margin = Peak output power - specification limit.

Reference numbers of test equipment used

HL 4355	HL 3903	HL 5288	HL 5902				
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Full description is given in Appendix A.

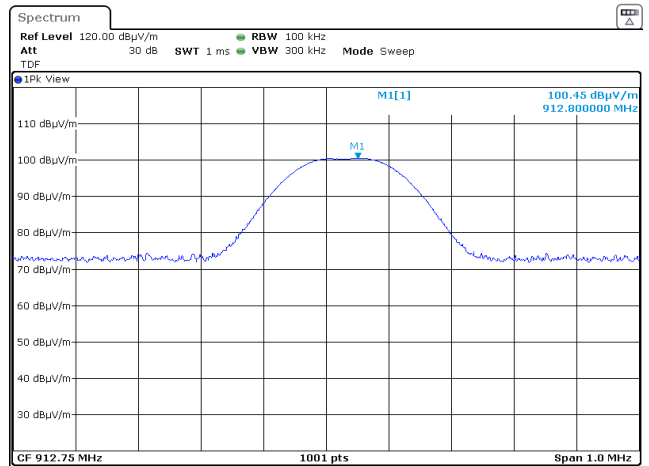
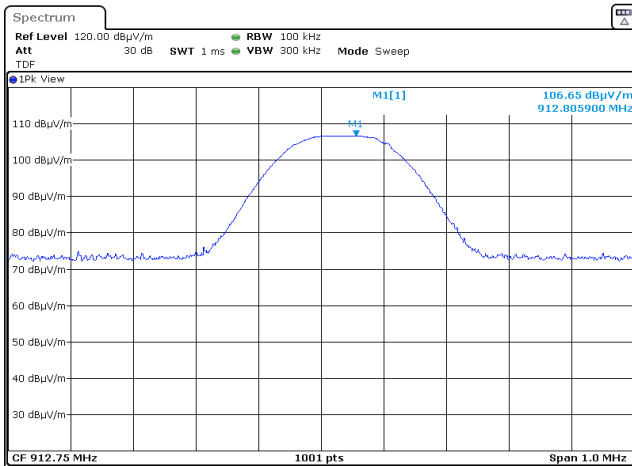


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Test specification: Section 15.247(b), RSS-247 section 5.4(1), Peak output power			
Test procedure: ANSI C63.10, section 7.8.5			
Test mode: Compliance		Verdict: PASS	
Date(s): 31-May-22			
Temperature: 23 °C	Relative Humidity: 43 %	Air Pressure: 1012 hPa	Power: 3 VDC
Remarks:			

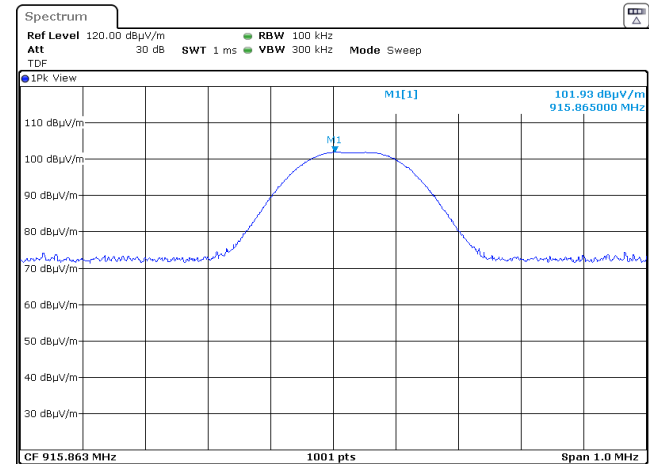
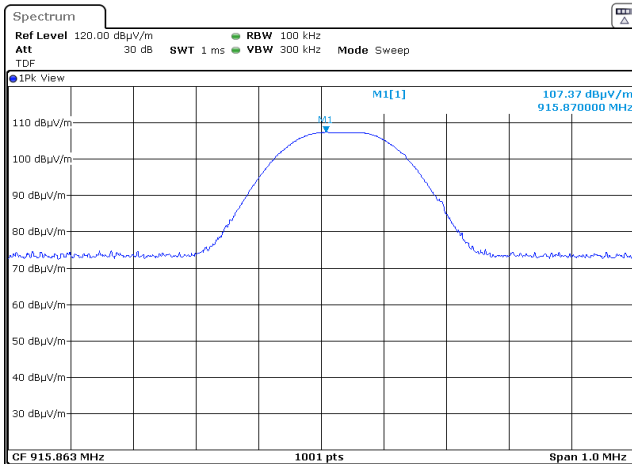
Plot 7.1.1 Field strength of carrier at low frequency

ANTENNA POLARIZATION: Vertical and Horizontal



Plot 7.1.2 Field strength of carrier at mid frequency

ANTENNA POLARIZATION: Vertical and Horizontal



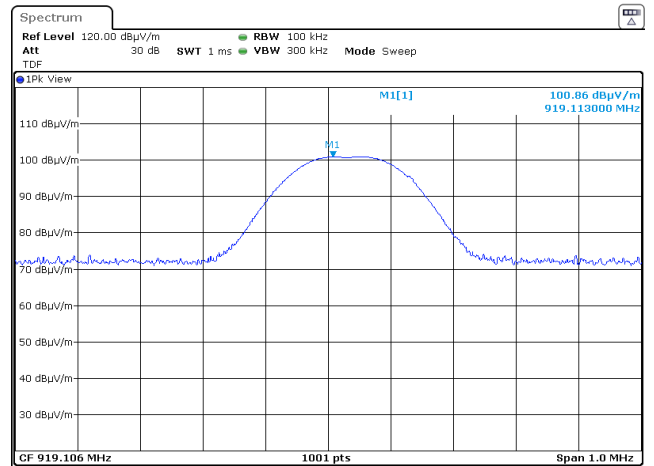
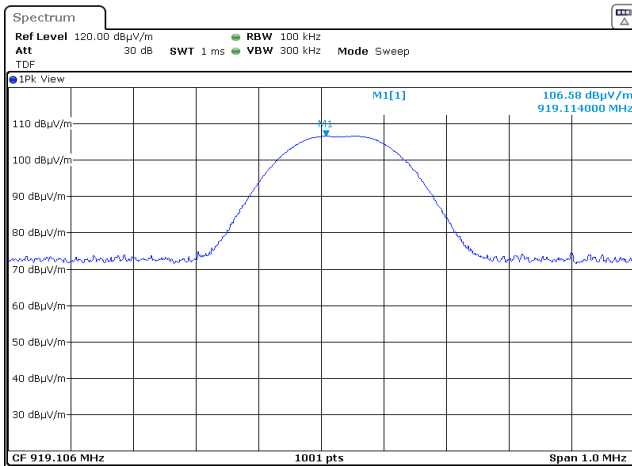


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Test specification: Section 15.247(b), RSS-247 section 5.4(1), Peak output power			
Test procedure: ANSI C63.10, section 7.8.5			
Test mode: Compliance		Verdict: PASS	
Date(s): 31-May-22			
Temperature: 23 °C	Relative Humidity: 43 %	Air Pressure: 1012 hPa	Power: 3 VDC
Remarks:			

Plot 7.1.3 Field strength of carrier at high frequency

ANTENNA POLARIZATION: Vertical and Horizontal





Test specification: Section 15.247(d), RSS-247 section 5.5, Radiated spurious emissions			
Test procedure: ANSI C63.10, sections 6.5, 6.6			
Test mode: Compliance		Verdict: PASS	
Date(s): 03-Jun-22			
Temperature: 25 °C	Relative Humidity: 53 %	Air Pressure: 1012 hPa	Power: 3 VDC
Remarks:			

7.2 Field strength of spurious emissions

7.2.1 General

This test was performed to measure field strength of spurious emissions from the EUT. Specification test limits are given in Table 7.2.1.

Table 7.2.1 Radiated spurious emissions limits

Frequency, MHz	Field strength at 3 m within restricted bands, dB(μ V/m) ^{***}			Attenuation of field strength of spurious versus carrier outside restricted bands, dBc ^{***}
	Peak	Quasi Peak	Average	
0.009 – 0.090	148.5 – 128.5	NA	128.5 – 108.5 ^{**}	20.0
0.090 – 0.110	NA	108.5 – 106.8 ^{**}	NA	
0.110 – 0.490	126.8 – 113.8	NA	106.8 – 93.8 ^{**}	
0.490 – 1.705	NA	73.8 – 63.0 ^{**}	NA	
1.705 – 30.0*		69.5		
30 – 88		40.0		
88 – 216		43.5		
216 – 960		46.0		
960 - 1000		54.0		
1000 – 10 th harmonic	74.0	NA	54.0	

*- The limit for 3 m test distance was calculated using the inverse square distance extrapolation factor as follows:

$$\text{Lim}_{S_2} = \text{Lim}_{S_1} + 40 \log(S_1/S_2),$$

where S_1 and S_2 – standard defined and test distance respectively in meters.

** - The limit decreases linearly with the logarithm of frequency.

*** - The field strength limits applied from the lowest radio frequency generated in the device, without going below 9 kHz up to the tenth harmonic of the highest fundamental frequency.

7.2.2 Test procedure for spurious emission field strength measurements in 9 kHz to 30 MHz band

7.2.2.1 The EUT was set up as shown in Figure 7.2.1, energized and the performance check was conducted.

7.2.2.2 The specified frequency range was investigated with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360° and the measuring antenna was rotated around its vertical axis.

7.2.2.3 The worst test results (the lowest margins) were recorded and shown in the associated plots.

7.2.3 Test procedure for spurious emission field strength measurements above 30 MHz

7.2.3.1 The EUT was set up as shown in Figure 7.2.2, Figure 1.1.3, energized and the performance check was conducted.

7.2.3.2 The specified frequency range was investigated with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360°, the measuring antenna height was changed from 1 to 4 m, its polarization was switched from vertical to horizontal.

7.2.3.3 The worst test results (the lowest margins) were recorded and shown in the associated plots.



Test specification: Section 15.247(d), RSS-247 section 5.5, Radiated spurious emissions			
Test procedure: ANSI C63.10, sections 6.5, 6.6			
Test mode: Compliance		Verdict: PASS	
Date(s): 03-Jun-22			
Temperature: 25 °C	Relative Humidity: 53 %	Air Pressure: 1012 hPa	Power: 3 VDC
Remarks:			

Figure 7.2.1 Setup for spurious emission field strength measurements below 30 MHz

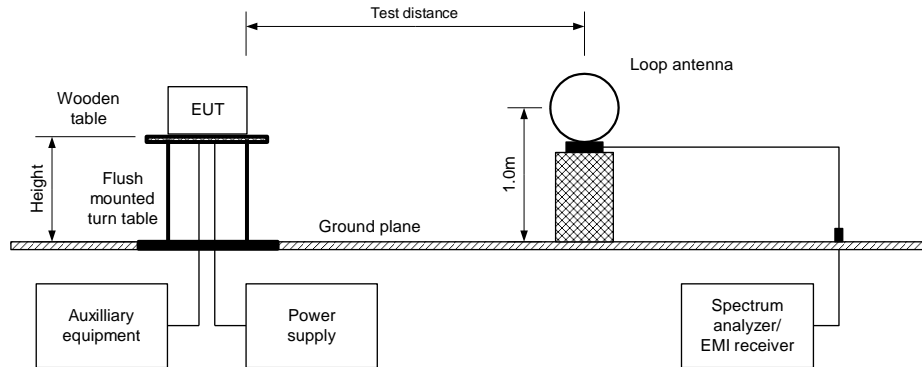
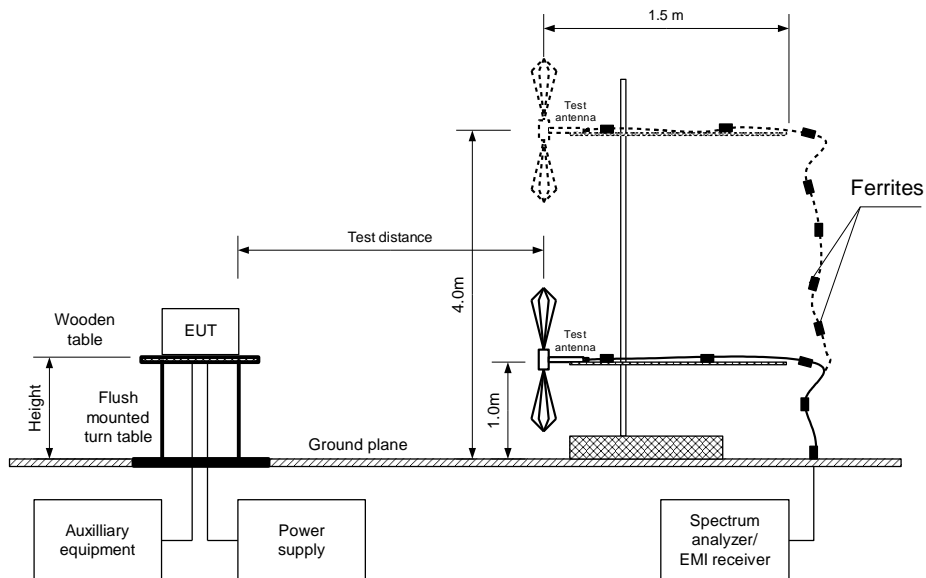


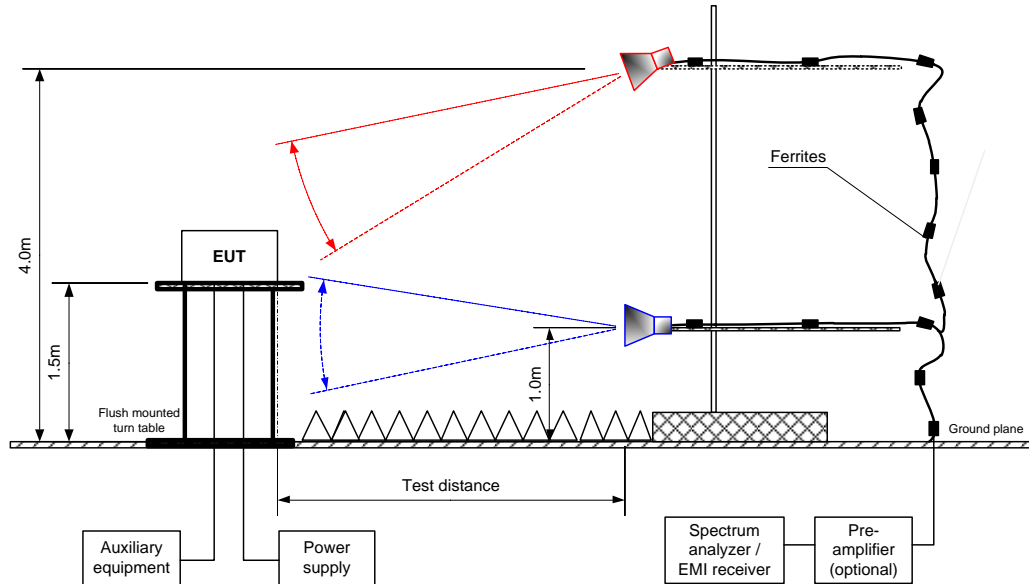
Figure 7.2.2 Setup for spurious emission field strength measurements from 30 to 1000 MHz





Test specification: Section 15.247(d), RSS-247 section 5.5, Radiated spurious emissions			
Test procedure: ANSI C63.10, sections 6.5, 6.6		Verdict: PASS	
Test mode: Compliance		Date(s): 03-Jun-22	
Temperature: 25 °C	Relative Humidity: 53 %	Air Pressure: 1012 hPa	Power: 3 VDC
Remarks:			

Figure 7.2.3 Setup for spurious emission field strength measurements above 1000 MHz





Test specification: Section 15.247(d), RSS-247 section 5.5, Radiated spurious emissions			
Test procedure: ANSI C63.10, sections 6.5, 6.6			
Test mode: Compliance		Verdict: PASS	
Date(s): 03-Jun-22			
Temperature: 25 °C	Relative Humidity: 53 %	Air Pressure: 1012 hPa	Power: 3 VDC
Remarks:			

Table 7.2.2 Field strength of emissions outside restricted bands

ASSIGNED FREQUENCY: 902-928 MHz
 INVESTIGATED FREQUENCY RANGE: 0.009 -9500MHz
 TEST DISTANCE: 3 m
 MODULATION: GFSK
 BIT RATE: 50 Kbps
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum
 DETECTOR USED: Peak
 TEST ANTENNA TYPE: Active loop (9 kHz – 30 MHz)
 Biconilog (30 MHz – 1000 MHz)
 Double ridged guide (above 1000 MHz)
 FREQUENCY HOPPING: Disabled

Frequency, MHz	Field strength of spurious, dB(µV/m)	Antenna polarization	Antenna height, m	Azimuth, degrees*	Field strength of carrier, dB(µV/m)	Attenuation below carrier, dBc	Limit, dBc	Margin, dB**	Verdict
Low carrier frequency									
1825.50	48.2	V	1.8	65	106.65	58.45	20.0	38.45	Pass
5476.50	46.2	H	2.0	-32		60.45		40.45	
6389.25	45.3	H	1.0	56		61.35		41.35	
Mid carrier frequency									
1831.726	46.3	V	2.0	63	107.37	61.07	20.0	41.07	Pass
5495.178	45.2	H	2.0	-35		62.17		42.17	
6411.041	48.7	H	2.3	58		58.67		38.67	
High carrier frequency									
1838.212	48.1	V	1.5	46	106.58	58.48	20.0	38.48	Pass
5514.636	46.3	H	1.8	29		61.07		41.07	
6433.742	46.1	H	2.5	68		61.27		41.27	

*- EUT front panel refers to 0 degrees position of turntable.

**- Margin = Specification limit- attenuation below carrier.



Test specification: Section 15.247(d), RSS-247 section 5.5, Radiated spurious emissions			
Test procedure: ANSI C63.10, sections 6.5, 6.6			
Test mode: Compliance		Verdict: PASS	
Date(s): 03-Jun-22			
Temperature: 25 °C	Relative Humidity: 53 %	Air Pressure: 1012 hPa	Power: 3 VDC
Remarks:			

Table 7.2.3 Field strength of spurious emissions above 1 GHz within restricted bands

ASSIGNED FREQUENCY: 902-928 MHz
 INVESTIGATED FREQUENCY RANGE: 1000 – 9500 MHz
 TEST DISTANCE: 3 m
 MODULATION: GFSK
 BIT RATE: 50 Kbps
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum
 DETECTOR USED: Peak
 RESOLUTION BANDWIDTH: 1 MHz
 TEST ANTENNA TYPE: Double ridged guide
 FREQUENCY HOPPING: Disabled

Frequency, MHz	Antenna		Azimuth, degrees*	Peak field strength			Average field strength				Verdict
	Polarization	Height, m		Measured, dB(µV/m)	Limit, dB(µV/m)	Margin, dB**	Measured, dB(µV/m)	Calculated, dB(µV/m)	Limit, dB(µV/m)	Margin, dB***	
Low carrier frequency											
2738.25	H	1.3	-16	52.7	74	-21.3	52.7	24.7	54	-29.3	Pass
3651.00	H	2.0	-26	49.1	74	-24.9	49.1	21.1	54	-32.9	
4563.75	H	1.5	47	51.6	74	-22.4	51.6	23.6	54	-30.4	
7302.00	H	2.0	-35	57.4	74	-16.6	57.4	29.4	54	-24.6	
8114.75	H	1.7	-40	46.9	74	-27.1	46.9	18.9	54	-35.1	
Mid carrier frequency											
2747.589	H	1.8	-8	52.1	74	-21.9	52.1	24.1	54	-29.9	Pass
3663.452	H	1.8	-27	44.8	74	-29.2	44.8	16.8	54	-37.2	
4579.315	H	1.3	-8	54.2	74	-19.8	54.2	26.2	54	-27.8	
7326.904	H	2.4	-34	56.0	74	-18.0	56.0	28.0	54	-26.0	
9158.630	H	2.4	-145	48.6	74	-25.4	48.6	20.6	54	-33.4	
High carrier frequency											
2757.318	H	1.9	-34	51.2	74	-22.8	51.2	23.2	54	-30.8	Pass
3676.424	H	2.0	-17	50.6	74	-23.4	50.6	22.6	54	-31.4	
4595.530	H	1.7	-5	51.4	74	-22.6	51.4	23.4	54	-30.6	
7352.848	H	2.3	-28	56.1	74	-17.9	56.1	28.1	54	-25.9	
9191.060	H	2.0	2	47.2	74	-26.8	47.2	19.2	54	-34.8	

*- EUT front panel refers to 0 degrees position of turntable.
 **- Margin = Measured field strength - specification limit.
 ***- Margin = Calculated field strength - specification limit,
 where Calculated field strength = Measured field strength + average factor.

Table 7.2.4 Average factor calculation

Transmission pulse		Transmission burst		Transmission train duration, ms	Average factor, dB
Duration, ms	Period, s	Duration, ms	Period, ms		
4	256	NA	NA	NA	-28

*- Average factor was calculated as follows for pulse train shorter than 100 ms:

$$Average\ factor = 20 \times \log_{10} \left(\frac{Pulse\ duration}{Pulse\ period} \times \frac{Burst\ duration}{Train\ duration} \times Number\ of\ bursts\ within\ pulse\ train \right)$$

for pulse train longer than 100 ms:

$$Average\ factor = 20 \times \log_{10} \left(\frac{Pulse\ duration}{Pulse\ period} \times \frac{Burst\ duration}{100ms} \times Number\ of\ bursts\ within\ 100ms \right)$$



Test specification: Section 15.247(d), RSS-247 section 5.5, Radiated spurious emissions			
Test procedure: ANSI C63.10, sections 6.5, 6.6			
Test mode: Compliance		Verdict: PASS	
Date(s): 03-Jun-22			
Temperature: 25 °C	Relative Humidity: 53 %	Air Pressure: 1012 hPa	Power: 3 VDC
Remarks:			

Table 7.2.5 Field strength of spurious emissions below 1 GHz within restricted bands

ASSIGNED FREQUENCY: 902-928 MHz
 INVESTIGATED FREQUENCY RANGE: 0.009 – 1000 MHz
 TEST DISTANCE: 3 m
 MODULATION: GFSK
 MODULATING SIGNAL: PRBS
 BIT RATE: 50 kbps
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum
 RESOLUTION BANDWIDTH: 0.2 kHz (9 kHz – 150 kHz)
 9.0 kHz (150 kHz – 30 MHz)
 120 kHz (30 MHz – 1000 MHz)
 VIDEO BANDWIDTH: > Resolution bandwidth
 TEST ANTENNA TYPE: Active loop (9 kHz – 30 MHz)
 Biconilog (30 MHz – 1000 MHz)
 FREQUENCY HOPPING: Disabled

Frequency, MHz	Peak emission, dB(µV/m)	Quasi-peak			Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
		Measured emission, dB(µV/m)	Limit, dB(µV/m)	Margin, dB*				
Low, mid, high carrier frequency								
No spurious were founded								Pass

*- Margin = Measured emission - specification limit.
 **- EUT front panel refer to 0 degrees position of turntable.

Reference numbers of test equipment used

HL5902	HL5288	HL4933	HL4339	HL3903	HL0446		
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Full description is given in Appendix A.



HERMON LABORATORIES

Test specification: Section 15.247(d), RSS-247 section 5.5, Radiated spurious emissions			
Test procedure: ANSI C63.10, sections 6.5, 6.6			
Test mode: Compliance		Verdict: PASS	
Date(s): 03-Jun-22			
Temperature: 25 °C	Relative Humidity: 53 %	Air Pressure: 1012 hPa	Power: 3 VDC
Remarks:			

Table 7.2.6 Restricted bands according to FCC section 15.205

MHz	MHz	MHz	MHz	MHz	GHz
0.09 - 0.11	8.37625 - 8.38675	73 - 74.6	399.9 - 410	2690 - 2900	10.6 - 12.7
0.495 - 0.505	8.41425 - 8.41475	74.8 - 75.2	608 - 614	3260 - 3267	13.25 - 13.4
2.1735 - 2.1905	12.29 - 12.293	108 - 121.94	960 - 1240	3332 - 3339	14.47 - 14.5
4.125 - 4.128	12.51975 - 12.52025	123 - 138	1300 - 1427	3345.8 - 3358	15.35 - 16.2
4.17725 - 4.17775	12.57675 - 12.57725	149.9 - 150.05	1435 - 1626.5	3600 - 4400	17.7 - 21.4
4.20725 - 4.20775	13.36 - 13.41	156.52475 - 156.52525	1645.5 - 1646.5	4500 - 5150	22.01 - 23.12
6.215 - 6.218	16.42 - 16.423	156.7 - 156.9	1660 - 1710	5350 - 5460	23.6 - 24
6.26775 - 6.26825	16.69475 - 16.69525	162.0125 - 167.17	1718.8 - 1722.2	7250 - 7750	31.2 - 31.8
6.31175 - 6.31225	16.80425 - 16.80475	167.72 - 173.2	2200 - 2300	8025 - 8500	36.43 - 36.5
8.291 - 8.294	25.5 - 25.67	240 - 285	2310 - 2390	9000 - 9200	Above 38.6
8.362 - 8.366	37.5 - 38.25	322 - 335.4	2483.5 - 2500	9300 - 9500	

Table 7.2.7 Restricted bands according to RSS-Gen

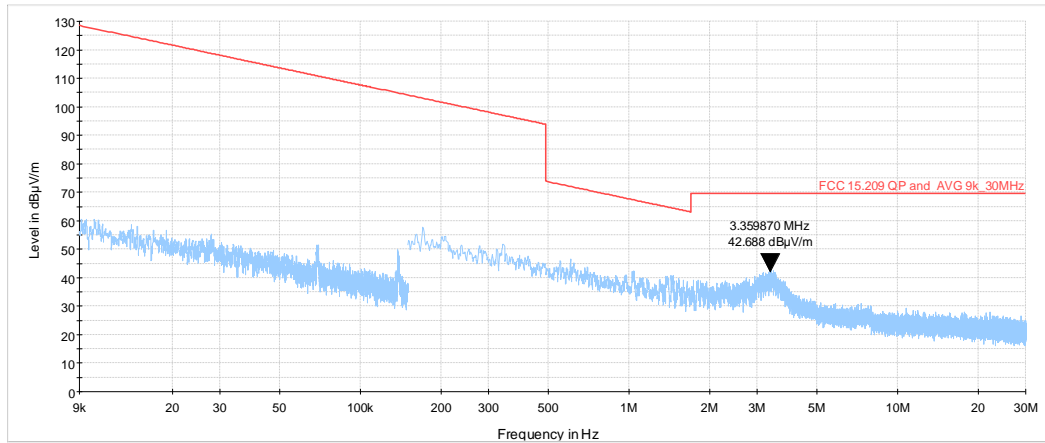
MHz	MHz	MHz	MHz	MHz	GHz
0.09 - 0.11	8.291 - 8.294	16.80425 - 16.80475	399.9 - 410	3260 - 3267	10.6 - 12.7
2.1735 - 2.1905	8.362 - 8.366	25.5 - 25.67	608 - 614	3332 - 3339	13.25 - 13.4
3.020 - 3.026	8.37625 - 8.38675	37.5 - 38.25	960 - 1427	3345.8 - 3358	14.47 - 14.5
4.125 - 4.128	8.41425 - 8.41475	73 - 74.6	1435 - 1626.5	3500 - 4400	15.35 - 16.2
4.17725 - 4.17775	12.29 - 12.293	74.8 - 75.2	1645.5 - 1646.5	4500 - 5150	17.7 - 21.4
4.20725 - 4.20775	12.51975 - 12.52025	108 - 138	1660 - 1710	5350 - 5460	22.01 - 23.12
5.677 - 5.683	12.57675 - 12.57725	156.52475 - 156.52525	1718.8 - 1722.2	7250 - 7750	23.6 - 24
6.215 - 6.218	13.36 - 13.41	156.7 - 156.9	2200 - 2300	8025 - 8500	31.2 - 31.8
6.26775 - 6.26825	16.42 - 16.423	240 - 285	2310 - 2390	9000 - 9200	36.43 - 36.5
6.31175 - 6.31225	16.69475 - 16.69525	322 - 335.4	2655 - 2900	9300 - 9500	Above 38.6



Test specification: Section 15.247(d), RSS-247 section 5.5, Radiated spurious emissions			
Test procedure: ANSI C63.10, sections 6.5, 6.6			
Test mode: Compliance		Verdict: PASS	
Date(s): 03-Jun-22			
Temperature: 25 °C	Relative Humidity: 53 %	Air Pressure: 1012 hPa	Power: 3 VDC
Remarks:			

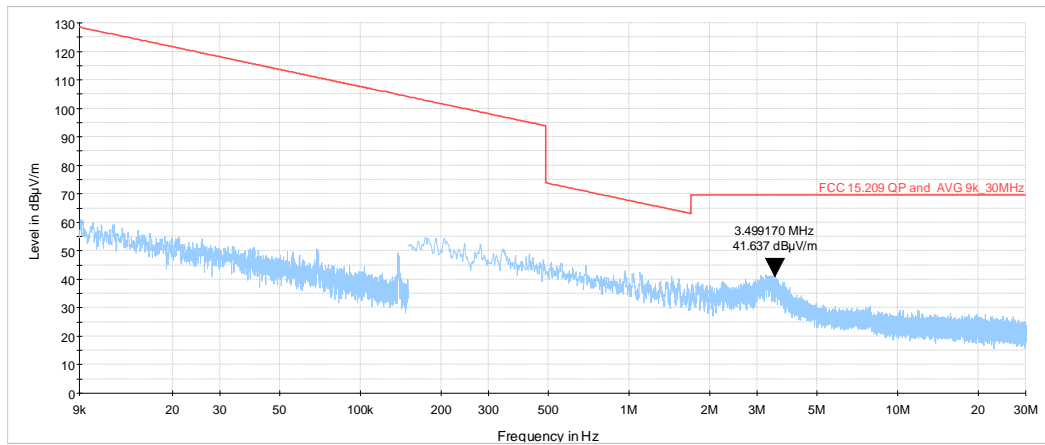
Plot 7.2.1 Radiated emission measurements from 9 kHz to 30 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m



Plot 7.2.2 Radiated emission measurements from 9 kHz to 30 MHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m

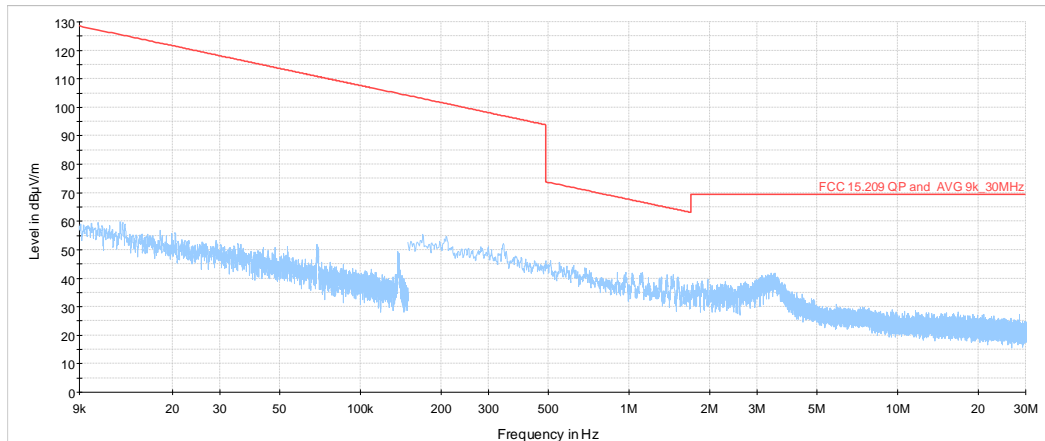




Test specification: Section 15.247(d), RSS-247 section 5.5, Radiated spurious emissions			
Test procedure: ANSI C63.10, sections 6.5, 6.6			
Test mode: Compliance		Verdict: PASS	
Date(s): 03-Jun-22			
Temperature: 25 °C	Relative Humidity: 53 %	Air Pressure: 1012 hPa	Power: 3 VDC
Remarks:			

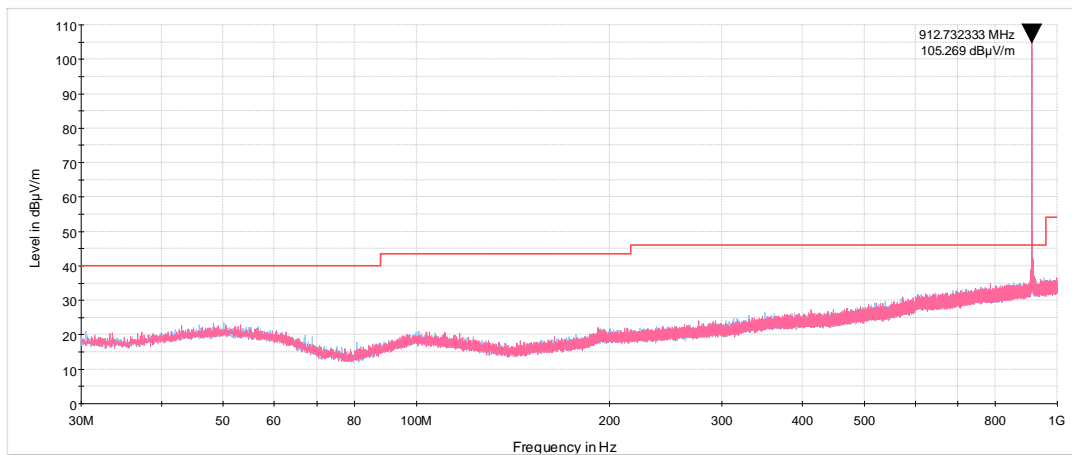
Plot 7.2.3 Radiated emission measurements from 9 kHz to 30 MHz at the high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m



Plot 7.2.4 Radiated emission measurements from 30 to 1000 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

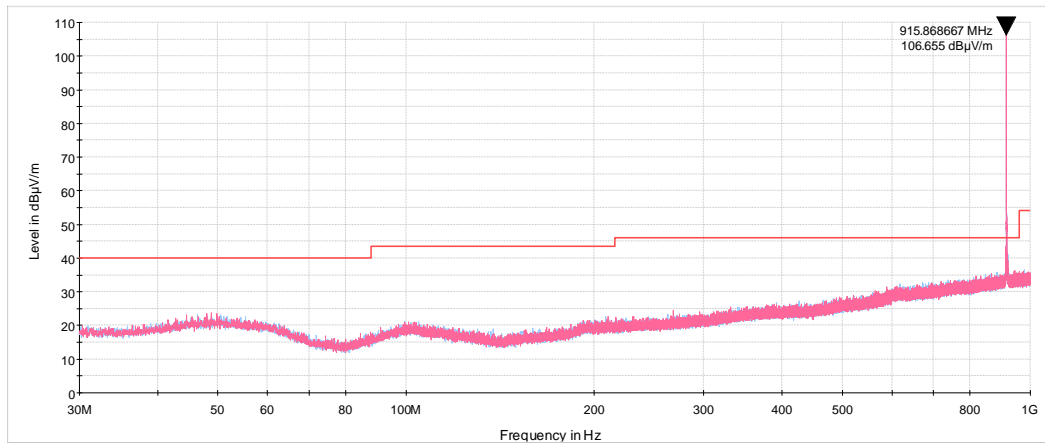




Test specification: Section 15.247(d), RSS-247 section 5.5, Radiated spurious emissions			
Test procedure: ANSI C63.10, sections 6.5, 6.6			
Test mode: Compliance		Verdict: PASS	
Date(s): 03-Jun-22			
Temperature: 25 °C	Relative Humidity: 53 %	Air Pressure: 1012 hPa	Power: 3 VDC
Remarks:			

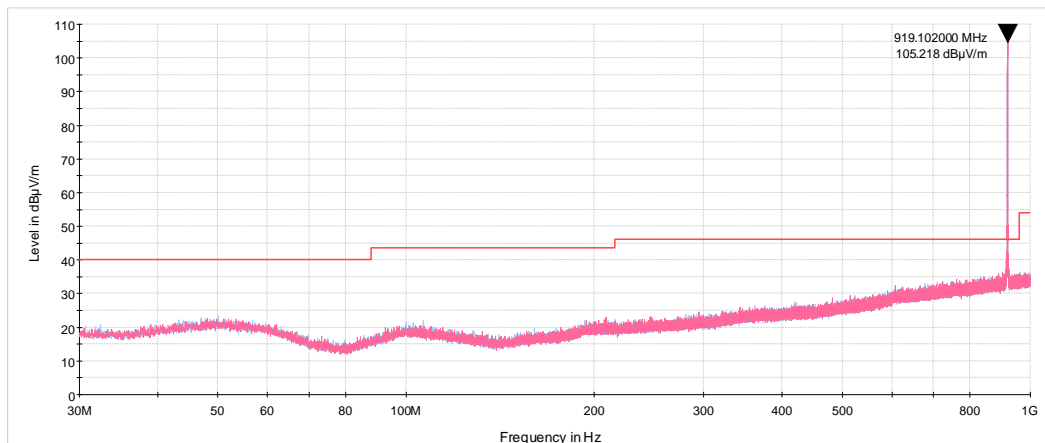
Plot 7.2.5 Radiated emission measurements from 30 to 1000 MHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal



Plot 7.2.6 Radiated emission measurements from 30 to 1000 MHz at the high carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal

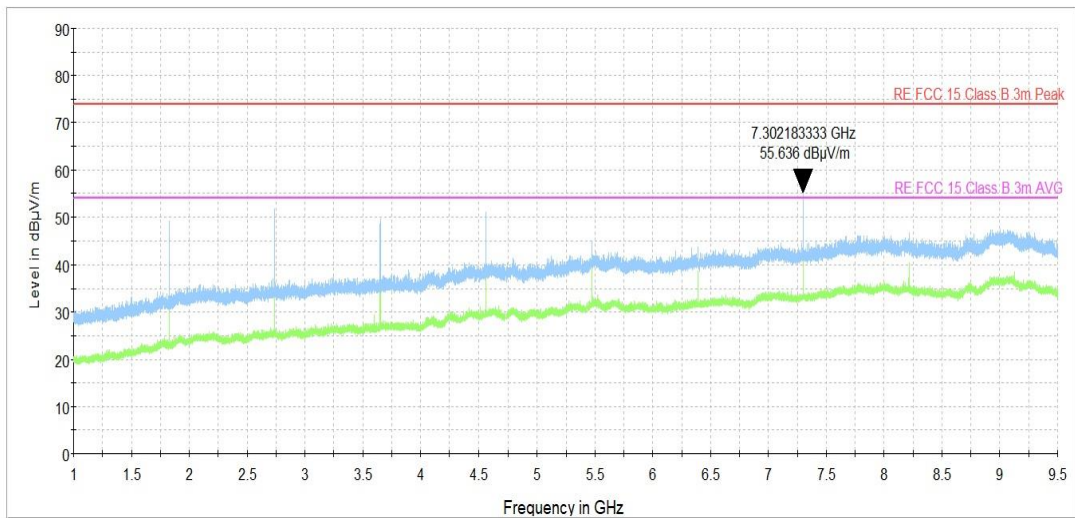




Test specification: Section 15.247(d), RSS-247 section 5.5, Radiated spurious emissions			
Test procedure: ANSI C63.10, sections 6.5, 6.6			
Test mode: Compliance		Verdict: PASS	
Date(s): 03-Jun-22			
Temperature: 25 °C	Relative Humidity: 53 %	Air Pressure: 1012 hPa	Power: 3 VDC
Remarks:			

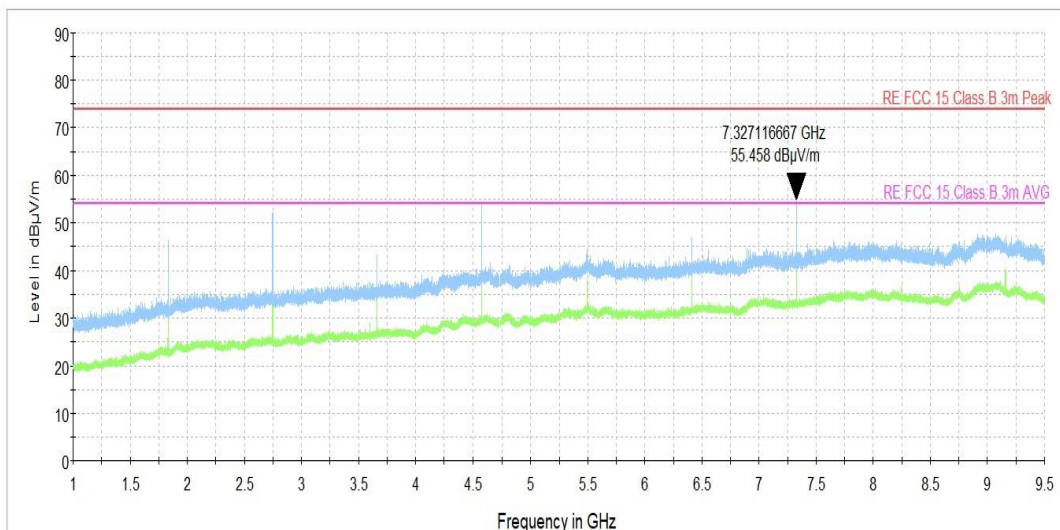
Plot 7.2.7 Radiated emission measurements from 1000 to 9500 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal



Plot 7.2.8 Radiated emission measurements from 1000 to 9500 MHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal

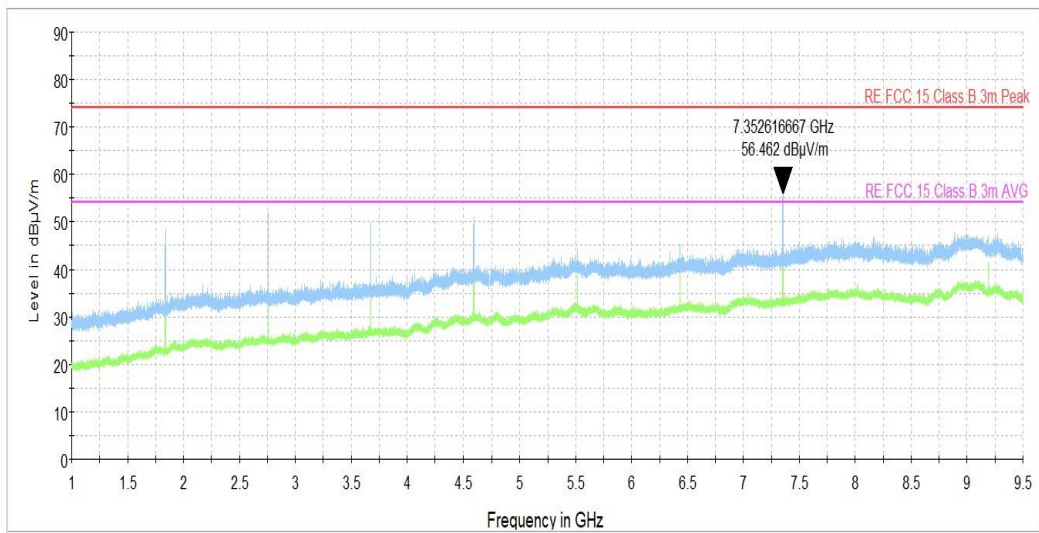




Test specification: Section 15.247(d), RSS-247 section 5.5, Radiated spurious emissions			
Test procedure: ANSI C63.10, sections 6.5, 6.6			
Test mode: Compliance		Verdict: PASS	
Date(s): 03-Jun-22			
Temperature: 25 °C	Relative Humidity: 53 %	Air Pressure: 1012 hPa	Power: 3 VDC
Remarks:			

Plot 7.2.9 Radiated emission measurements from 1000 to 9500 MHz at the high carrier frequency

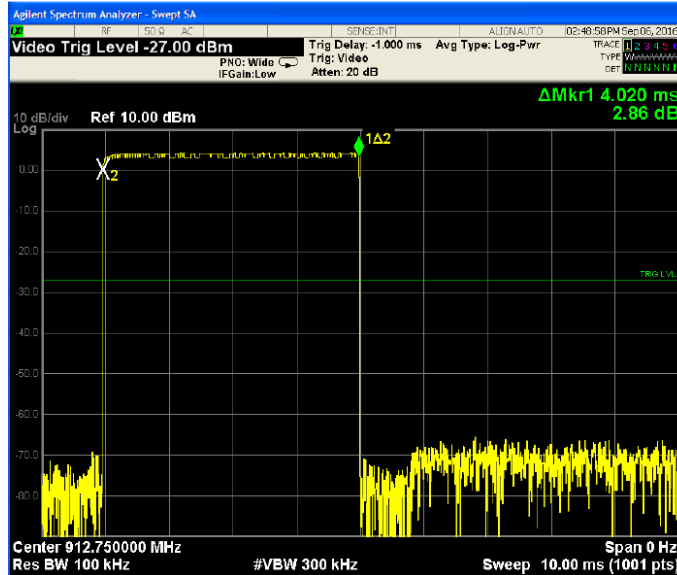
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



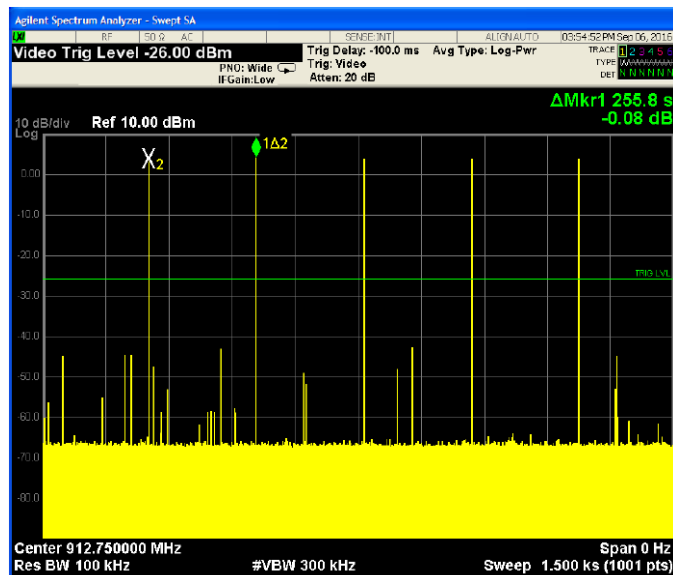


Test specification: Section 15.247(d), RSS-247 section 5.5, Radiated spurious emissions			
Test procedure: ANSI C63.10, sections 6.5, 6.6			
Test mode: Compliance		Verdict: PASS	
Date(s): 03-Jun-22			
Temperature: 25 °C	Relative Humidity: 53 %	Air Pressure: 1012 hPa	Power: 3 VDC
Remarks:			

Plot 7.2.10 Transmission pulse duration



Plot 7.2.11 Transmission pulse period





Test specification: Section 15.109, RSS-Gen, Section 7.1.2, ICES-003, Radiated emission			
Test procedure: ANSI C63.4, Section 12.2.5			
Test mode: Compliance		Verdict: PASS	
Date(s): 03-Jun-22			
Temperature: 25 °C	Relative Humidity: 53 %	Air Pressure: 1012 hPa	Power: 3 VDC
Remarks:			

8 Unintentional emissions

8.1 Radiated emission measurements

8.1.1 General

This test was performed to measure radiated emissions from the EUT enclosure. Specification test limits are given in Table 8.1.1.

Table 8.1.1 Radiated emission test limits

Frequency, MHz	Class B limit, dB(μV/m)		Class A limit, dB(μV/m)	
	10 m distance	3 m distance	10 m distance	3 m distance
30 - 88	29.5*	40.0	39.0	49.5*
88 - 216	33.0*	43.5	43.5	54.0*
216 - 960	35.5*	46.0	46.4	56.9*
Above 960	43.5*	54.0	49.5	60.0*

* The limit for test distance other than specified was calculated using the inverse linear distance extrapolation factor as follows: $Lims_2 = Lims_1 + 20 \log(S_1/S_2)$, where S_1 and S_2 – standard defined and test distance respectively in meters.

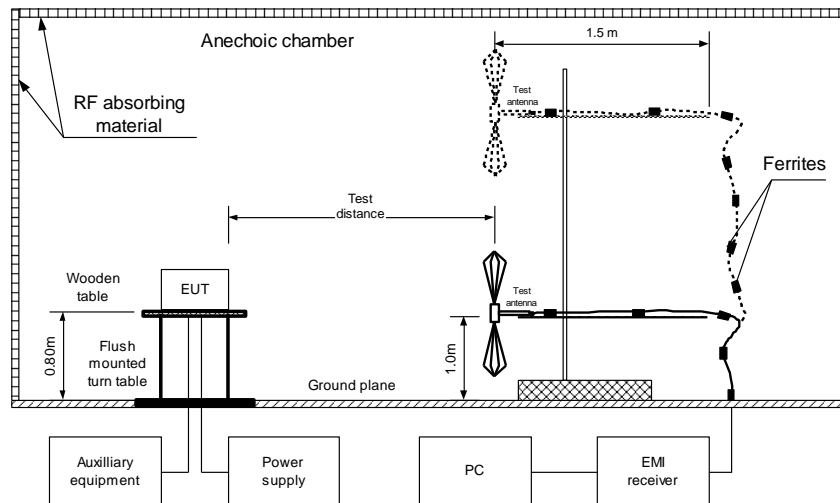
8.1.2 Test procedure

8.1.2.1 The EUT was set up as shown in Figure 8.1.1 and associated photograph/s, energized and the performance check was conducted.

8.1.2.2 The specified frequency range was investigated with biconilog antenna connected to EMI receiver. To find maximum radiation the turntable was rotated 360°, the measuring antenna height was changed from 1 to 4 m, its polarization was switched from vertical to horizontal and the EUT cables position was varied.

8.1.2.3 The worst test results (the lowest margins) were recorded in Table 8.1.2 and shown in the associated plots.

Figure 8.1.1 Setup for radiated emission measurements in anechoic chamber, table-top equipment





Test specification: Section 15.109, RSS-Gen, Section 7.1.2, ICES-003, Radiated emission			
Test procedure: ANSI C63.4, Section 12.2.5			
Test mode: Compliance		Verdict: PASS	
Date(s): 03-Jun-22			
Temperature: 25 °C	Relative Humidity: 53 %	Air Pressure: 1012 hPa	Power: 3 VDC
Remarks:			

Table 8.1.2 Radiated emission test results

EUT SET UP: TABLE-TOP
LIMIT: Class B
EUT OPERATING MODE: Receive
TEST SITE: SEMI ANECHOIC CHAMBER
TEST DISTANCE: 3 m
DETECTORS USED: PEAK / QUASI-PEAK
FREQUENCY RANGE: 30 MHz – 1000 MHz
RESOLUTION BANDWIDTH: 120 kHz

Frequency, MHz	Peak emission, dB(µV/m)	Quasi-peak			Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
		Measured emission, dB(µV/m)	Limit, dB(µV/m)	Margin, dB*				
No emission peaks found								Pass

TEST SITE: SEMI ANECHOIC CHAMBER
TEST DISTANCE: 3 m
DETECTORS USED: PEAK / AVERAGE
FREQUENCY RANGE: 1000 MHz – 5000 MHz
RESOLUTION BANDWIDTH: 1000 kHz

Frequency, MHz	Peak			Average			Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
	Measured emission, dB(µV/m)	Limit, dB(µV/m)	Margin, dB*	Measured emission, dB(µV/m)	Limit, dB(µV/m)	Margin, dB*				
No emission peaks found										Pass

*- Margin = Measured emission - specification limit.
**- EUT front panel refer to 0 degrees position of turntable.

Reference numbers of test equipment used

HL 5288	HL 4933	HL 3903	HL 5902				
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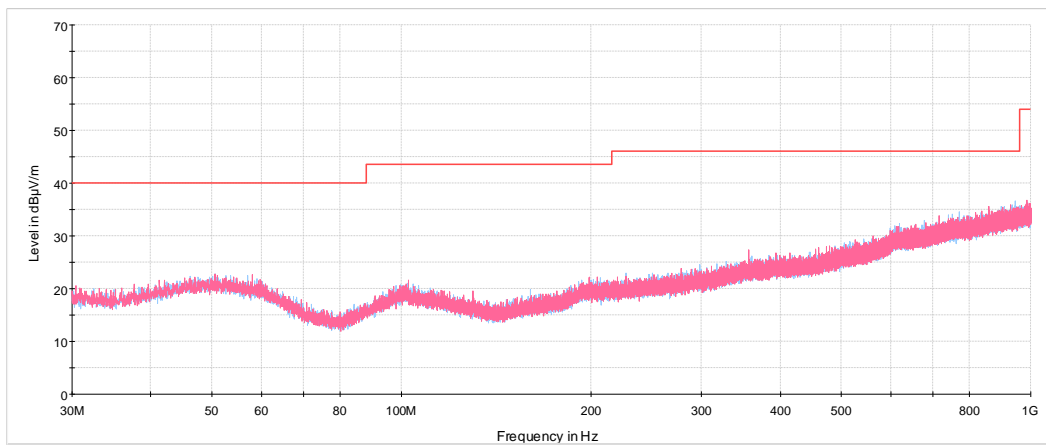
Full description is given in Appendix A.



Test specification: Section 15.109, RSS-Gen, Section 7.1.2, ICES-003, Radiated emission			
Test procedure: ANSI C63.4, Section 12.2.5			
Test mode: Compliance		Verdict: PASS	
Date(s): 03-Jun-22			
Temperature: 25 °C	Relative Humidity: 53 %	Air Pressure: 1012 hPa	Power: 3 VDC
Remarks:			

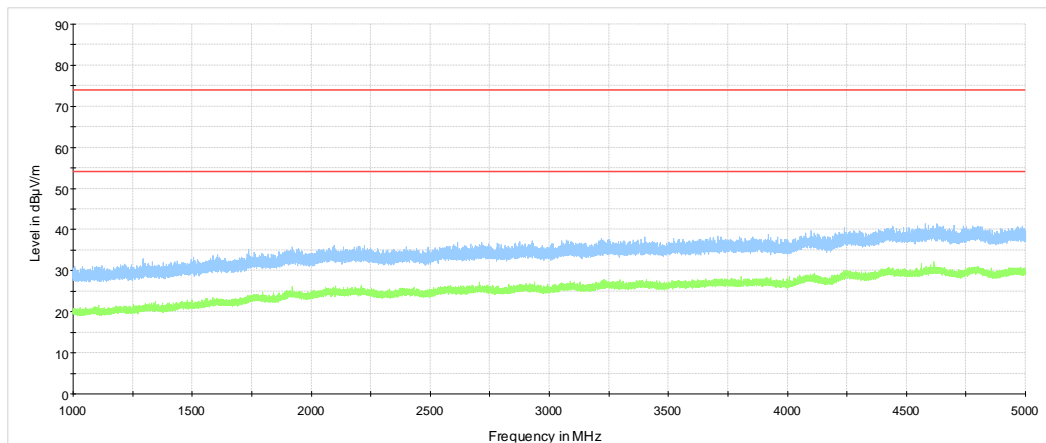
Plot 8.1.1 Radiated emission measurements in 30 - 1000 MHz range, vertical and horizontal antenna polarization

TEST SITE: Semi anechoic chamber
LIMIT: Class B
TEST DISTANCE: 3 m
EUT OPERATING MODE: Receive



Plot 8.1.2 Radiated emission measurements above 1000 MHz, vertical and horizontal antenna polarization

TEST SITE: Semi anechoic chamber
LIMIT: Class B
TEST DISTANCE: 3 m
EUT OPERATING MODE: Receive





9 APPENDIX A Test equipment and ancillaries used for tests

HL No	Description	Manufacturer	Model	Ser. No.	Last Cal./ Check	Due Cal./ Check
0446	Antenna, Loop, Active, 10 (9) kHz - 30 MHz	EMCO	6502	2857	28-Feb-22	28-Feb-23
3903	Microwave Cable Assembly, 40.0 GHz, 1.5 m, SMA/SMA	Huber-Suhner	SUCOFL EX 102A	1226/2A	07-Apr-22	07-Apr-23
4355	Signal and Spectrum Analyzer, 9 kHz to 7 GHz	Rohde & Schwarz	FSV 7	101630	20-Sep-21	20-Sep-22
4933	Active Horn Antenna, 1 GHz to 18 GHz	COM-POWER CORPORATION	AHA-118	701046	13-Jan-22	13-Jan-23
5288	Trilog Antenna, 25 MHz - 8 GHz, 100W	Frankonia	ALX-8000E	00809	24-Mar-22	24-Apr-25
5902	RF cable, 18 GHz, 6.0m, N-type	Huber-Suhner	SF126EA/11N/11N/6000	NA	16-Jan-22	16-Jan-23



10 APPENDIX B Test equipment correction factors

HL 4933: Active Horn Antenna
COM-POWER CORPORATION, model: AHA-118, s/n 701046

Frequency, MHz	Measured antenna factor (with preamplifier), dB/m
1000	-16.1
1500	-15.1
2000	-10.9
2500	-11.9
3000	-11.1
3500	-10.6
4000	-8.6
4500	-8.3
5000	-5.9
5500	-5.7
6000	-3.3
6500	-4.0
7000	-2.2
7500	-1.7
8000	1.1
8500	-0.8
9000	-1.5
9500	-0.2

Frequency, MHz	Measured antenna factor (with preamplifier), dB/m
10000	1.8
10500	1.0
11000	0.3
11500	-0.5
12000	3.1
12500	1.4
13000	-0.3
13500	-0.4
14000	2.5
14500	2.2
15000	1.9
15500	0.5
16000	2.1
16500	1.2
17000	0.6
17500	3.1
18000	4.2

The antenna factor shall be added to receiver reading in dB μ V to obtain field strength in dB μ V/m.



HL 0446: Active Loop Antenna
EMCO, model: 6502, s/n 2857

Frequency,	Measured antenna factor, dBS/m	Measurement uncertainty, dB
10	-33.4	±1.0
20	-37.8	±1.0
50	-40.5	±1.0
75	-41.0	±1.0
100	-41.2	±1.0
150	-41.2	±1.0
250	-41.1	±1.0
500	-41.2	±1.0
750	-41.3	±1.0
1000	-41.3	±1.0

Frequency,	Measured antenna factor, dBS/m	Measurement uncertainty, dB
2000	-41.4	±1.0
3000	-41.4	±1.0
4000	-41.5	±1.0
5000	-41.5	±1.0
10000	-41.7	±1.0
15000	-42.1	±1.0
20000	-42.7	±1.0
25000	-44.2	±1.0
30000	-45.8	±1.0

The antenna factor shall be added to receiver reading in dB μ V to obtain field strength in dB μ A/m.



11 APPENDIX C Measurement uncertainties

Expanded uncertainty at 95% confidence in Hermon Labs EMC measurements

Test description	Expanded uncertainty
Conducted carrier power at RF antenna connector	Below 12.4 GHz: ± 1.7 dB 12.4 GHz to 40 GHz: ± 2.3 dB
Conducted emissions at RF antenna connector	9 kHz to 2.9 GHz: ± 2.6 dB 2.9 GHz to 6.46 GHz: ± 3.5 dB 6.46 GHz to 13.2 GHz: ± 4.3 dB 13.2 GHz to 22.0 GHz: ± 5.0 dB 22.0 GHz to 26.8 GHz: ± 5.5 dB 26.8 GHz to 40.0 GHz: ± 4.8 dB
Occupied bandwidth	± 8.0 %
Duty cycle, timing (Tx ON / OFF) and average factor measurements	± 1.0 %
Conducted emissions with LISN	9 kHz to 150 kHz: ± 3.9 dB 150 kHz to 30 MHz: ± 3.8 dB
Radiated emissions at 3 m measuring distance Horizontal polarization Vertical polarization	Biconilog antenna: ± 5.3 dB Biconical antenna: ± 5.0 dB Log periodic antenna: ± 5.3 dB Double ridged horn antenna: ± 5.3 dB Biconilog antenna: ± 6.0 dB Biconical antenna: ± 5.7 dB Log periodic antenna: ± 6.0 dB Double ridged horn antenna: ± 6.0 dB

Hermon Laboratories is accredited by A2LA for calibration according to present requirements of ISO/IEC 17025 and NCSL Z540-1. The accreditation is granted to perform calibration of parameters that are listed in the Scope of Hermon Laboratories Accreditation.

Hermon Laboratories calibrates its reference and transfer standards by calibration laboratories accredited to ISO/IEC 17025 by a mutually recognized Accreditation Body or by a recognized national metrology institute. All reference and transfer standards used in the calibration system are traceable to national or international standards.

In-house calibration of all test and measurement equipment is performed on a regular basis according to Hermon Laboratories calibration procedures, manufacturer calibration/verification procedures or procedures defined in the relevant standards. The Hermon Laboratories test and measurement equipment is calibrated within the tolerances specified by the manufacturers and/or by the relevant standards.



12 APPENDIX D Test laboratory description

Tests were performed at Hermon Laboratories Ltd., which is a fully independent, private, EMC, Radio, Safety, Environmental and Telecommunication testing facility.

Hermon Laboratories is recognized and accredited by the Federal Communications Commission (USA) for relevant parts of Code of Federal Regulations 47 (CFR 47), Test Firm Registration Number is 927748, Designation Number is IL1001; Recognized by Innovation, Science and Economic Development Canada for wireless and terminal testing (ISED), ISED #2186A, CAB identifier is IL1001; Certified by VCCI, Japan (the registration numbers for OATS are R-10808 for RE measurements below 1 GHz, G-20112 for RE measurements above 1 GHz, R-11082 for anechoic chamber for RE measurements below 1 GHz, G-10869 for RE measurements above 1 GHz, C-10845 for conducted emissions site and T-11606 for conducted emissions at telecommunication ports).

The laboratory is accredited by American Association for Laboratory Accreditation (USA) according to ISO/IEC 17025 for electromagnetic compatibility, product safety, telecommunications testing, environmental simulation and calibration (for exact scope please refer to Certificate No. 839.01, 839.03 and 839.04).

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Telephone: +972 4628 8001
Fax: +972 4628 8277
e-mail: mail@hermonlabs.com
website: www.hermonlabs.com

Person for contact: Mr. Michael Nikishin, EMC&Radio group manager

13 APPENDIX E Specification references

FCC 47CFR part 15: 2020	Radio Frequency Devices
ANSI C63.10: 2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
ANSI C63.4: 2014	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.
RSS-247 Issue 2: 2017	Digital Transmission Systems (DTSS), Frequency Hopping Systems (FHSs) and Licence- Exempt Local Area Network (LE-LAN) Devices
RSS-Gen Issue 5 with_amendment_1_2: 2021	General Requirements and Information for the Certification of Radiocommunication Equipment
ICES-003: 2020, Issue 7	Information Technology Equipment (Including Digital Apparatus) – Limits and methods of measurement



HERMON LABORATORIES

14 APPENDIX F Manufacturer's declaration



Visonic Ltd.
24 Habarzel Street
P.O.Box 22020
Tel-Aviv 69710, Israel

Tele: +972 3 645 6789
Fax: +972 3 645 6788
www.visonic.com

Declaration of Identity

We, the undersigned,

Company: Visonic Ltd
Address: 24 Habarzel Street
Country: Israel
Telephone number: +972 3 6456 789
Fax number: +972 3 6456 788

Declare under our sole responsibility that the following equipment:

Brand/Item	Type/Model	Short Product description
Johnson Controls	MP-802 P9M0	PG+ Wireless PIR Motion Detector, 915MHz

Is electronically/electrically identical to the following equipment:

Brand/Item	Type/Model	Short Product description
Visonic	MP-802 K9-85 PG2	PowerG Wireless PIR Motion Detector, 915MHz

The differences are: New PCB design meet to new plastic, antenna –the same P/N different reference designator, upgraded operational low frequency (0.3 - 5Hz) PIR sensor signal amplifier without any relation to radio, added SW1 back tamper functionality, new plastic enclosure design, flash added, addition of some new supplementary SW features.

13/07/2022

Zuri Rubin

Certification Manager - Visonic



15 APPENDIX G Abbreviations and acronyms

A	ampere
AC	alternating current
A/m	ampere per meter
AM	amplitude modulation
AVRG	average (detector)
cm	centimeter
dB	decibel
dBm	decibel referred to one milliwatt
dB(μ V)	decibel referred to one microvolt
dB(μ V/m)	decibel referred to one microvolt per meter
dB(μ A)	decibel referred to one microampere
DC	direct current
EIRP	equivalent isotropically radiated power
ERP	effective radiated power
EUT	equipment under test
F	frequency
GHz	gigahertz
GND	ground
H	height
HL	Hermon laboratories
Hz	hertz
k	kilo
kHz	kilohertz
LO	local oscillator
m	meter
MHz	megahertz
min	minute
mm	millimeter
ms	millisecond
μ s	microsecond
NA	not applicable
NB	narrow band
OATS	open area test site
Ω	Ohm
PM	pulse modulation
PS	power supply
ppm	part per million (10^{-6})
QP	quasi-peak
RE	radiated emission
RF	radio frequency
rms	root mean square
Rx	receive
s	second
T	temperature
Tx	transmit
V	volt
WB	wideband

END OF DOCUMENT